



# Satellite Remote Sensing for Measuring Urban Heat Islands and Constructing Heat Vulnerability Indices

August 2, 4, 9, & 11, 2022

11:00-12:30 or 15:00-16:30 EDT (UTC-4)

Remote sensing provides global, timely, objective observations to monitor the effects of urban heat islands (UHI) over time. Thermal mapping from satellites can be used to monitor land surface temperature (LST), while optical data collected from satellites can inform where and when land use and land cover have changed over time and can be used to approximate air temperatures. Once UHIs have been mapped, incorporating socioeconomic data pertaining to population, demographics, and health information into heat vulnerability indices (HVI) can help guide interventions to manage heat related risks to public health. This 3-part advanced webinar will build on ARSET's urban heat island training held in November 2020 with hands-on exercises for participants to measure UHI and construct HVIs for their areas of interest.

## Part 1: Land Surface Temperature-Based Surface Urban Heat Island Mapping

Presenters: Sean McCartney & Amita Mehta

- Overview of ARSET
- Background on UHI
- Demonstration of using Landsat 4-9 LST and Suomi-NPP VIIRS for measuring SUHI
- Lab time for participants to analyze LST and SUHI for their area of interest
- Question & Answer Session

## Part 2: Integrating Socioeconomic Data with Satellite Imagery for Constructing Heat Vulnerability Indices - Section 1

Presenters: Kathryn Conlon, Evan Mallen

- Review previous session and introduce guest speakers
- Introduction to common methods used to create heat vulnerability indices (HVI)
- Techniques for effectively using HVI results to inform exposure and mitigation efforts
- Case studies showing how heat vulnerability mapping informed urban planning
- Question & Answer Session



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### **Part 3: Integrating Socioeconomic Data with Satellite Imagery for Constructing Heat Vulnerability Indices - Section 2**

Presenters: Kathryn Conlon, Evan Mallen

- Review previous session
- Demonstration on constructing HVI
- Lab time for participants to construct HVI
- Question & Answer Session

### **Part 4: Using High-Resolution, Satellite Derived Hot-Humid Heat Estimates and Gridded Population Data to Map Extreme Heat Exposure Worldwide**

Presenter: Cascade Tuholske

- Review previous session and introduce guest speaker
- Introduction to Wet Bulb Globe Temperature
- Overview of Global High Resolution Daily Extreme Urban Heat Exposure (UHE-Daily), v1 (1983–2016)
- Overview of Annual Global High-Resolution Extreme Heat Estimates, 1983-2016
- Jupyter Notebook Demonstration
- Questions and Answer Session



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